

ABSTRACT OF THE DISCLOSURE

Treatment of digested or O₂ delignified cellulosic pulp in a chlorine dioxide (D₀) delignification stage, preceding bleaching of the pulp, at a medium pulp consistency for an extended period of time. Unexpected benefits include improvement in the delignification efficiency and selectivity, a lowering of the chlorine dioxide consumption in the overall post-digestion or post-O₂ delignification and bleaching process, a reduction in the filtrate volume, a reduction of COD/AOX from an ECF bleaching plant, improved pulp properties, and enhanced removal of Hex-A. The process may be implemented in existing three, four or five-stage bleaching plants.